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### RESEARCH ARTICLE

#### STUDY OF BACTERIAL CULTURE IN SINONASAL POLYPOSIS PATIENTS UNDERGOING ENDOSCOPIC SINUS SURGERY.

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#### Abstract

Chronic rhinosinusitis is one of the most common condition for which a patient seeks advice of a physician. Chronic rhinosinusitis is the inflammation of nose and para nasal sinuses for more than 12 weeks. In US, about 30 million patients per year visit ENT clinics for sinusitis. Sinonasal polyposis (chronic rhinosinusitis with nasal polyps) are a subcategory of sinusitis and constitutes roughly 2-5% of patients with sinusitis. Although polyps are technically tumours, they are not malignant ones. Importance of polyp lies in the fact that nose has several vital functions in humans. First it is an entry point for air that we all breathe. It processes the air, acting as an excellent humidifier. Mucus production allows particulate trapping. It acts as a radiator that warms air. In addition to all this, it is the seat of sense of smell. Finally nose and paranasal sinuses adds resonance to voice. Cause of nasal polyp is still not clear. Many theories are being hypothesised but not proven beyond doubt. Whatever be the cause, polyp can cause nasal obstruction and affect the quality of life of patients. Hence treatment is a must for any symptomatic nasal polyp.

Judicious use of antibiotics are a must for successful outcome of any surgery especially head and neck surgeries. Endoscopic Sinus Surgery is not an exception. Antibiotics, however do not have a direct impact on the immediate postoperative outcome. Its effect is by controlling the bacterial load (both normal and pathogenic), which affects long term outcome. Antibiotics resistance mainly due to rampant and injudicious use of antibiotics is now a major factor affecting many treatment decisions. Infact it is now proven to be one of important causes for failure in Endoscopic Sinus Surgery, but not the most common. Hence it was necessary to evaluate the bacterial culture and sensitivity in polyposis cases and to determine the effectiveness of commonly used antibiotics.

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#### Aim Of The Study:-

1. To identify the predominant bacterial species in nasal cavities of sinonasal polyposis patient, undergoing FESS, preoperatively and post operatively.
2. To ascertain the antibiotic sensitivity of the identified organism

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3. To evaluate the efficacy of most commonly used antibiotics in our hospital.

### Materials And Methods:-

Study was carried out during the period between August 2016 to January 2017 at the Department of Otorhinolaryngology of Government Rajaji Hospital attached to Madurai Medical College, Madurai.

Patients subjected to the study were those with sinonasal polyposis posted for endoscopic sinus surgeries after taking anaesthesia fitness. Nasal swabs of patients were taken 1 day prior to surgery. Swabs were taken from nasal cavity floor, lateral wall and from the surface of the polyp on both sides. Postoperative swabs were taken on the 10th postoperative day. Postoperative swabs were from the nasal cavity floor and postoperative middle meatus. Revision FESS cases were not taken up for study.

Swabs obtained from the patients were sent to the microbiology department of Madurai Medical College for bacterial culture and sensitivity after proper labelling with a request form mentioning the pre or postoperative status of the sample. Bacterial culture was done for all the samples made available. Sensitivity was tested for the most commonly used antibiotics in our department (ampicillin, gentamicin, cotrimoxazole, erythromycin, cephalexin, cefotaxime, ceftriaxone, cloxacillin, doxycycline and ciprofloxacin).

Results obtained from the study were compiled and compared with those done at higher centres.

### Observations And Results:-

#### 1. Age Distribution

Age in Years	No of Patients	Percentage
<20	6	12
21-30	14	28
31-40	10	20
41-50	15	30
>50	5	10
Total	50	100

Out of 50 patients, maximum number of patients were from 41-50 years age group and followed by 21-30 years group. Together this group constituted 58 % of all the cases. Youngest patients was 15 years old and the oldest 65 years old.

#### 2. Sex distribution

Sex	No of patients	Percentage
Male	34	68
Female	16	32
Total	50	100

Majority of the patients were males. Major reasons for which was willingness for surgery was high among males. Medical line of management was acceptable to many patients mostly females even though chances of complete remission of symptoms were explained to be remote.

#### 3. Preoperative Bacterial Culture

Culture	No of Patients	Percentage
No growth	18	36
Coagulase Negative Staphylococcus(CONS)	21	42
Staph aureus	11	22
Total	50	100

Preoperative bacterial culture was positive in 32 out of the 50 cases with the rest of the culture showing no growth. 21 cases has coagulase negative staphylococcus and rest had staphylococcus aureus culture.

#### 4. Coagulase Negative Staphylococcus (preoperative)

Antibiotics	Resistant	Sensitive
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Ampicillin	21	0
Gentamycin	21	0
Cotrimoxazole	8	13
Ciprofloxacin	0	21
Cefotaxime	21	0
Doxycycline	4	17
Cephalexine	21	0
Ceftriaxone	7	14
Erythromycin	0	21
Cloxacillin	8	13

CONS was seen in 21 cases. All cases had resistance to ampicillin, gentamycin, cefotaxime and cephalixin. Ceftriaxone resistance was seen only in 7 out of 21 cultures. Erythromycin and ciprofloxacin were sensitive in all cases.

#### 5. Staphylococcus aureus (preoperative)

Antibiotics	Resistant	Sensitive
Ampicillin	11	0
Gentamycin	11	0
Cotrimoxazole	0	11
Ciprofloxacin	0	11
Cefotaxime	0	11
Doxycycline	0	11
Cephalexine	0	11
Ceftriaxone	0	11
Erythromycin	0	11
Cloxacillin	0	11

Staphylococcus aureus cultures were found to be resistant only to ampicillin and gentamycin. Sensitivity to other antibiotics were 100% with few of them showing high sensitivity.

#### 6. Postoperative Bacterial Culture

No growth	20	55.5
Coagulase Negative Staphylococcus(CONS)	9	25
Staph aureus	7	19.5
Total	36	100

Out of 50 cases postoperative bacterial culture was done in 36 cases. 20 cases had no growth and 16 were positive. 9 out of 16 were coagulase negative staphylococcus and rest were staphylococcus aureus.

#### 7. Coagulase Negative Staphylococcus (postoperative)

Antibiotics	Resistant	Sensitive
Ampicillin	9	0
Gentamycin	9	0
Cotrimoxazole	0	9
Ciprofloxacin	0	9
Cefotaxime	8	1
Doxycycline	0	9
Cephalexine	9	0
Ceftriaxone	6	3
Erythromycin	0	9
Cloxacillin	0	9

9 cases of postoperative culture showed coagulase negative staphylococcus. Ampicillin, gentamycin, cephalixin resistance was seen in all cases. Interestingly one case of ceftriaxone sensitivity was seen. Ceftriaxone was resistant in 6 out of 9 cases.

## 8. Staphylococcus (postoperative)

Antibiotics	Resistant	Sensitive
Ampicillin	7	0
Gentamycin	7	0
Cotrimoxazole	0	7
Ciprofloxacin	0	7
Cefotaxime	0	7
Doxycycline	0	7
Cephalexine	0	7
Ceftriaxone	0	7
Erythromycin	0	7
Cloxacillin	0	7

Staphylococcus aureus culture was positive in 7 cases, all of which showed resistance to ampicillin and gentamycin. Rest of the tested antibiotics had excellent response to staphylococcus aureus.

**Discussion:-**

During the study period from August 2017 to January 2018, 50 patients with nasal polyps were taken up for the study. Majority of the patients were in the age group is 21- 50 yrs. Males constituted 68% of the total study group.

Preoperative bacterial culture of all the patients were taken. 18 of them showed no growth, 21 were positive for Coagulase negative staphylococcus (CONS) and 11 for Staphylococcus aureus.

CONS showed high resistance for ampicillin, gentamicin cefotaxime and cephalaxine in all culture. High sensitivity for ciprofloxacin and erythromycin. Varying results for cotrimoxazole, doxycycline and ceftriaxone, with more sensitive strains than resistant. Staphylococcus aureus was resistant only due to ampicillin and gentamicin. All other antibiotics were sensitive in all cases.

Post operatively bacterial culture was taken for 36 cases. 20 of them were negative, 9 cultures were positive for CONS and 7 for Staphylococcus aureus.

CONS showed complete resistance for ampicillin, gentamicin and cephalaxine. Only 1 case was sensitive for cefotaxime Sensitivity was there for cotrimoxazole, ciprofloxacin, doxycycline, erytheromycin and cloxacillin in all cases. Staphylococcus aureus was resistant only due to ampicillin and gentamicin.

Ampicillin, gentamicin, cefotaxime and ceftriaxone were most commonly used intravenous antibiotics among the tested. These were also the most commonly used antibiotic in almost all surgical procedures including endoscopic sinus surgeries. Resistance was found to these antibiotics in a majority of bacterial culture irrespective of being pre or postoperative.

**Conclusion:-**

1. Most common preoperative bacterial species culture was Coagulase negative staphylococcus followed by Staphylococcus aureus.
2. Most common postoperative bacterial species culture was Coagulase negative staphylococcus and Staphylococcus aureus.
3. Coagulase negative staphylococcus were found to be resistant to ampicillin, gentamicin, cefotaxime and cephalaxin. Sensitivity to ciprofloxacin and erythromycin was found in all cases.
4. Staphylococcus aureus was resistant to ampicillin and gentamicin only.
5. No major difference in the antibiotic s was seen in the cultures. However resistance to the commonly used intravenous antibiotics were seen in almost all cultures whether preoperative or postoperative.

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